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tions and voluntary generosity, although willing, are less able to be found and less capable at this time; already gauged as inadequate of themselves alone before the war, they obviously can not alone cope with the necessary undertakings now. The present is a time when a large-scale withdrawal of the government's financial support must prove most formidably crippling. Such crippling will be greater than the actual measure of the sum withdrawn would entail in ordinary times.

To pull down under emergency what has been built up through years of careful experience and is proving efficient can scarcely be ultimate economy. It is to unlearn a useful lesson learnt. Curtailment of the state aid—relatively small in this country—given to scientific research must harm the scientific production of the country. Some curtailment, however, at this time seems unavoidable. Though extension of buildings and equipment and *personnel* is wanted, it may be necessary to withhold that extension at this time, maintaining broadly the *status quo* ready for expansion when that is once more feasible. But if research be an indispensable factor in the rebuilding of the national life, sacrifices should not be required from it disproportionately greater than from other services of a similarly essential kind. Reduction of the state's support on a scale to entail ruin to the existent organization would be a wastage rather than an economy. Calmly viewed, what more reminiscent of the wastage of the war itself than for machinery actually constructed, assembled, and producing what is needful for a nation's strength as a pillar in the industrial and intellectual temple of the world, to be now under temporary change abandoned or broken up; and at a time when industry as a whole stands convinced of scientific research as a necessity for its recovery and well-being.

My hope would be that scientific research on its present maintenance will be considered part of the intellectual bread of the community, part of the bed-rock on which rests the efficiency, not to speak of the industrial equipment, of the nation; that it will be treated as such in the measure of state-support continued to it; that the state will remember that that support has to embrace at least both the universities on

one hand, and, on the other, the research institutions administered by the state, for this reason, namely, that the country's organization for research, complex in origin, yet economical and effective, stands as an integral system to the entire existence of which is essential an adequate state provision for both these constituent elements, indispensable, since they are, to the whole structure of the system.

C. S. SHERRINGTON

### HENRY MARION HOWE

IN the death of Professor Howe the world lost both a great scientist and a great teacher. There has been recorded in various places the account of his life and life work, of his honors and of his publications. When in 1917 he was presented with the John Fritz medal of the United Engineering Societies a complete record of his work as a metallurgist, as a teacher and as a writer was given, together with a list of his professional papers, of which there are over 300 titles (*Monthly Bulletin A. I. M. E.*, July, 1917, p. 30).

Henry Marion Howe died on May 14, 1922, at his residence in Bedford Hills, N. Y., after an illness of over a year. He was born at Boston, Mass., in March, 1848, the son of Dr. Samuel G. and Julia Ward Howe. His father was noted for his philanthropy and distinguished services in the Greek war for independence, while his mother, the author of the "Battle Hymn of the Republic," was a leader of many reforms, from the abolition of slavery to woman's suffrage. As Dr. Raymond at the presentation of the John Fritz medal said, "It was a good stock on both sides, making him heir to intellectual keenness and refinement, the capacity for both enthusiasm and perseverance, a passion for the pursuit of knowledge and a gift of clear and felicitous statement." For he was imbued with the spirit of scientific research, the love of investigation, a striking power of observation and of interpretation, to which was added his wonderful clearness in expressing his thoughts not alone in his writings but more especially in his lectures and in the presentation of his papers at scientific meetings.

Graduating from the Boston Latin School in

1865, he received the degree of A.B. from Harvard in 1869 and the B.S. in mining and metallurgy from the Massachusetts Institute of Technology in 1871. The following year he received the degree of A.M. from Harvard, followed by the LL.D. in 1905.

The practical side of his life began in iron and steel. He was superintendent of the Bessemer Steel Works, Joliet, in 1872, and of the Blair Iron and Steel Company, 1873-74. For some five years he devoted himself to the metallurgy of copper and improved copper smelting in Chile for the heirs of Augustus Hemenway, and then designed and built the works of the Orford Copper Company at Capelton and Eustis in the Province of Quebec and at Bergen Point, N. J., 1879-1882. This latter year he was manager of the Pima Copper-mining and Smelting Company of Arizona.

From 1883-97 he was a consulting metallurgist in Boston and at the same time lectured in metallurgy at the Institute of Technology. In 1897 he was called to the chair of metallurgy at Columbia University and became professor emeritus in 1913.

His notable books were "The Metallurgy of Steel," 1888 (translated into French) and "The Metallography of Steel and Cast Iron," 1916. They were both epoch making. In the first he accumulated all the notable interest-worthy material in the metallurgy of steel and with amazing insight arranged it so logically and so clearly as to bring out the significant similarities rather than the striking differences. In his last book we have a record of his own creative work and his interpretations of the newer results in metallography, striking out into a path far remote from the ordinary textbook and leading to a new country of thought and investigation.

His honors were many and varied and showed that his work and life were appreciated not only at home but abroad. He was Knight of the Order of St. Stanislas of Russia and Chevalier of the Legion of Honor, France. He had honorary membership in many of the societies, from the Royal Swedish Academy of Scientists to the Société d'Encouragement pour L'Industrie Nationale of France. He held fellowships in many of the academies and was

president of the American Society Testing Materials, the American Institute Mining Engineers, the International Association for Testing Materials and honorary vice-president of the Iron and Steel Institute of Great Britain.

He received the Bessemer medal of the Iron and Steel Institute of Great Britain, Eliot Cresson medal, Franklin Institute of Philadelphia, gold medal of the Verein zur Beförderung des Gewerbflusses, Berlin, gold medal of Société d'Encouragement pour l'Industrie Nationale of France, 1916, and John Fritz medal, United Engineering Societies, 1917. He received honorary doctor's degrees from Harvard, Lafayette and the University of Pittsburgh.

But it is as a teacher and as one who has followed the paths of research that Professor Howe should be honored above all. As a lecturer his diction was most simple and his ideas and logical development of thought so clear that the dullest could not help but understand it. In fact, his courses seemed very easy compared with collateral reading from text-books and the like, and to those of us who had the privilege of working with him in the laboratory his inspiration was immeasurable. Possessed of a kindly personality, he took a fatherly interest in us all and spared no pains in our training. His methods were new, too new for many of his associates to understand or appreciate, for he believed that science must be followed in an orderly and well-thought-out manner, that the problem should first of all be stated, our knowledge of the subject be reviewed and then a complete plan of campaign laid out before any experimental work was started, for he had no use and less respect for the old cook book methods of metallurgy, which unfortunately are not yet quite a thing of the past. Another marked characteristic was his tolerance and patience. While the systematic planning of work came naturally to him, yet he realized the difficulties in the paths of others and was never intolerant or unkindly critical when things went wrong, even when his advice had been neglected. Each of us was made to feel that he was a co-worker and not merely an assistant, and in that way the best of each of us was brought out and developed.

His thoughtfulness of others was always uppermost in his mind, and many a man had cause to thank him for pecuniary help, which was always made available in such a way that the most sensitive could not feel any hurt to his pride. "Outside jobs" were frequent; very often they were doubtless thought up by Professor Howe himself, and they were always paid for most generously.

In 1874 he married Fannie Gay, of Troy, who survives him. She was deeply interested in his work and always accompanied him on his travels and in his attendance at all scientific conventions. She so looked after him that she helped him to conserve his energy for the main purpose; in fact, without her aid he could never have accomplished all that he did. She was as much interested in his students as he was himself, and the little luncheons and dinners at their home were affairs to be sought after and remembered, for she knew us all by name and also knew all our old instructors—often from an angle new to us.

An enthusiastic advocate of the cause of the Allies, he served during the war and later as chairman of the engineering division of the National Research Council. He worked incessantly, and with his wonderful and extraordinary energy and activity he accomplished a great deal in the study of improved methods of the open hearth process and the methods of production of new alloy steels and their physical properties.

In short, we can say of him that he was a kindly gentleman, thoughtful of others; a great scientist, greatly honored and yet most modest; a remarkably clear writer with a gift of simplicity of thought and diction; and, lastly, he was undoubtedly the greatest of all the steel metallurgists.

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## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

### THE SALT LAKE CITY MEETING

THE summer meeting of the American Association for the Advancement of Science, to be held at Salt Lake City, June 22 to 24, will be a joint meeting of the American Association

with the Pacific Division of the association. This will be the seventy-fifth meeting of the association and the sixth annual meeting of the Pacific Division and its affiliated societies. The illustrated preliminary announcement of the meeting has recently been published and mailed to all members of the association.

The meeting will be held under the auspices of the Pacific Division. Dr. Barton Warren Evermann, president of the division, will preside at the general sessions and will deliver the presidential address at the opening session on Thursday evening, June 22. The general secretary of the association, Dr. D. T. MacDougal, will represent the larger organization. The hosts for this meeting are the University of Utah, the Utah Academy of Sciences, the Utah Agricultural College and the Brigham Young University. Much valuable help is being rendered by the City of Salt Lake, the Union Pacific System, the Hotel Utah and the Commercial Club of Salt Lake City.

A glance at the preliminary announcement shows that the Salt Lake City meeting will be successful in every way, an interesting and valuable meeting for all who attend. The city itself is unusually interesting from many view-points—scientific, educational, religious, commercial, social and artistic. The vicinity is famous for its agriculture and for its mining activities. The summer climate is very enjoyable, with sunny days and cool nights. Opportunities for the pleasures of outdoor life are furnished by the broad streets with their stately shade-trees, the beautiful parks and boulevards, the many canyons in the vicinity, and the famous bathing beach on Great Salt Lake.

The Hotel Utah is to be the official headquarters. No special railway rates will be available for those who attend this summer meeting, but advantage may be taken of the extraordinarily reduced summer excursion tariffs. The following examples give round-trip rates to Salt Lake City from the places named: From San Francisco, Sacramento, Oakland, Berkeley, Fresno, San Jose and Los Angeles, \$48.82; from Denver, \$36.10; from Omaha, \$50.25; from Kansas City, \$50.25; from St. Paul, \$62.30; from Chicago, \$60.00; from St. Louis, \$56.00; from Memphis, \$73.60; from New Orleans, \$85.15; from Fort Worth, \$64.15.